



Doosan Infracore
Machine Tools

PUMA 480

Heavy Duty Turning Center



Massive yet responsive Turning Centers without compromise. The most powerful machines in their class.

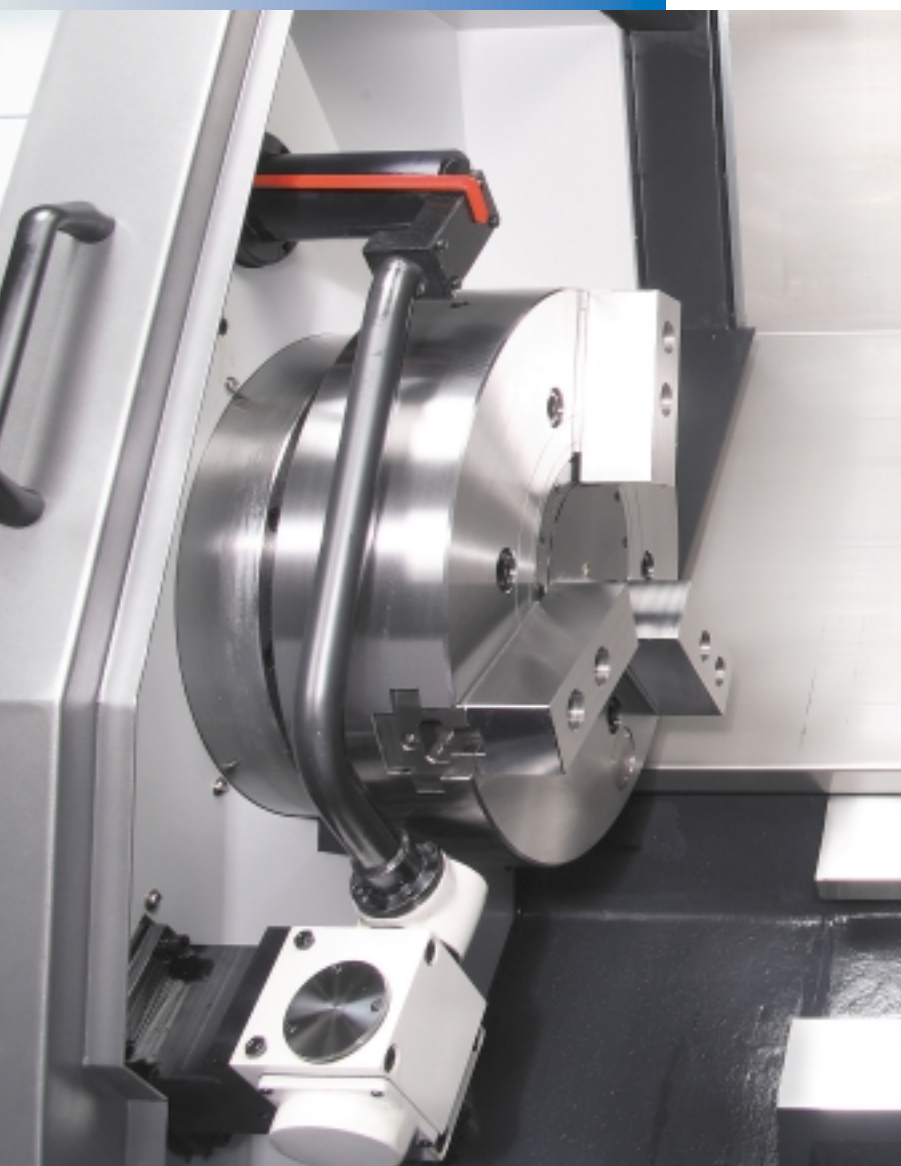
PUMA 480 series mainly focus its capacity on heavy duty cutting, wide range of cutting coverage along with rapid positioning and fast bi-directional turret-indexing.

PUMA 480





Main Spindle



Max. spindle speed

1,500 rpm

Motor (30 min)

45 kW

Headstock and Spindle Construction

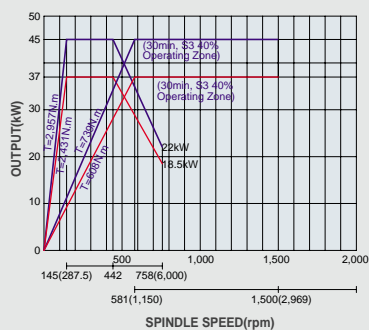
The headstock casting is made of Meehanite and ribbed on the outside to increase the surface area for better heat dissipation. The headstock and main spindle are manu-factured in a temperature controlled environment then assembled and tested in our clean room. The heavy duty cartridge type spindle is supported by a double row of cylindrical roller bearings in the front and rear, with duplex angular thrust bearings in between. The cylindrical roller bearings feature a large contact surface which ensures the highest rigidity for heavy loads and superior surface finishes. All spindle bearings are permanently grease lubricated precision class P4.



Main spindle power-torque diagram

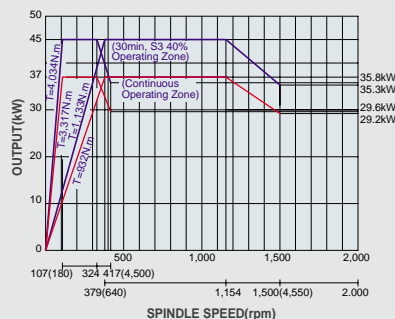
PUMA 480M[LM]

Spindle motor power : 45kW/30min.
(BF Gear Box)
Max. spindle speed : 1,500 rpm



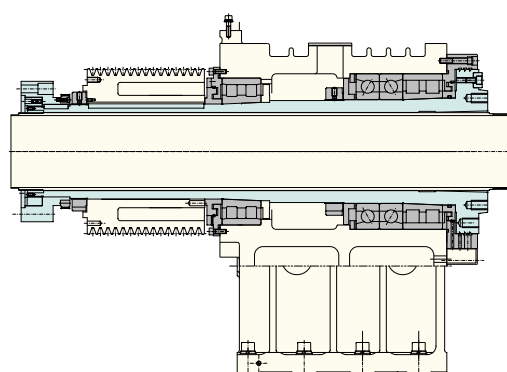
PUMA 480[L]

Spindle motor power : 45kW/30min.
(DI Gear Box)
Max. spindle speed : 1,500 rpm

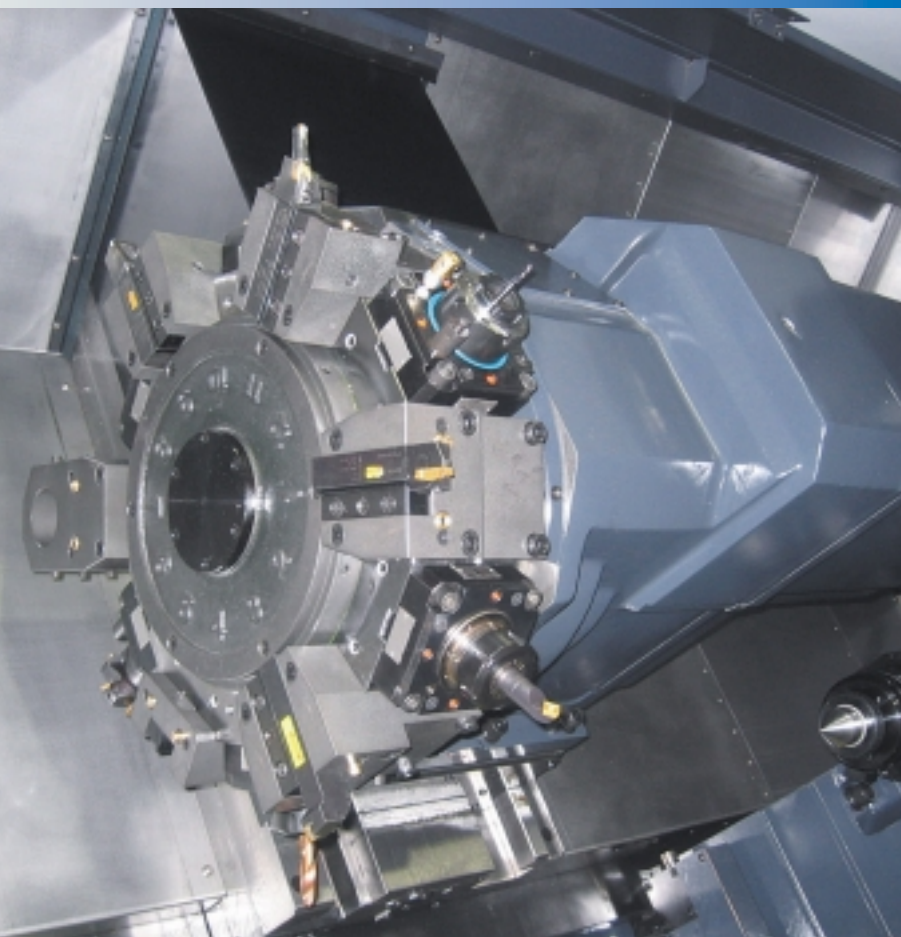


Headstock Cross Section

PUMA 480[L]/480M[LM]



Turret



Index time (1-station swivel)

0.25 sec.

No. of tool station

PUMA480[L]

10 station

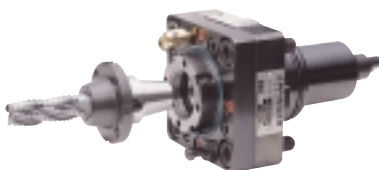
PUMA480M[LM]

12 station

Fast Turret Indexing

The large 12 and 10 station heavy duty turret features a large diameter Curvic coupling and hydraulic clamp force. The heavy duty design provides unsurpassed rigidity for heavy stock removal, fine surface finishes, long boring bar overhang ratios, and extended tool life. Turret rotation, deceleration and clamp are all controlled by a reliable high torque-hydraulic index motor. Unclamp and rotation are virtually simultaneous. Turret indexing is non-stop bi-directional, with a 0.25 second next station index time. Turning tools are securely attached to the turret by wedge clamps.

Preci-Flex Ready Rotary Tools



• Preci-flex adapter application



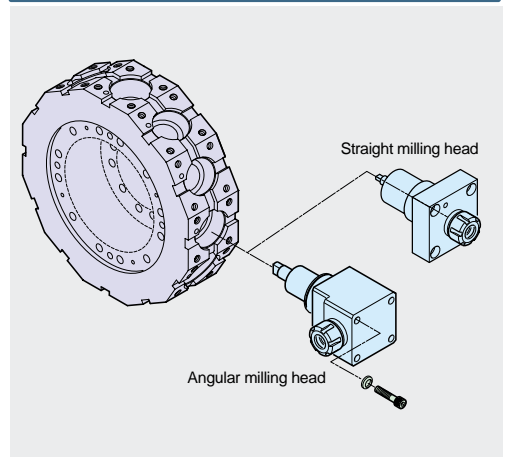
• Collet application

Preci-Flex ready rotary tool holders are available on the milling versions. Preci-Flex is a tooling system utilizes the existing ER collet taper in the rotary holders. The spindle face is precision ground relative to the taper and there are four drilled and tapped holders in this face. The Preci-Flex adapters locate on both the taper and the spindle face for maximum rigidity.

BMT Milling Turret

The large 12 station heavy duty turret features a large Curvic coupling diameter. This heavy duty design provides unsurpassed rigidity for heavy stock removal, fine surface finishes, and extended tool life. Indexing repeatability is ± 0.0055 degrees. Turret indexing is non-stop bi-directional. An extremely reliable high-torque hydraulic motor provides for quick turret indexing. 32mm square tool holders are mounted directly to the turret. The boring bar capacity is 60mm. The turret features a flexible design, allowing for left or right handed, ID or OD tool placement.

Radial BMT



Bed and Way Construction

Doosan Infracore precision machine tools are internationally known for their durability, rigidity and high accuracy. Only well proven and time tested manufacturing techniques can produce machines of this quality.



PUMA 480

The PUMA 480 series is a true 45 degree slant bed design. The bed is a one piece casting with both the saddle and tailstock guideways in the same plane to eliminate thermal distortion. The heavily ribbed torque tube design prevents twisting and deformation. Fine grain Meehanite processed cast iron is used because of its excellent dampening characteristics. This ensures high

rigidity with no deformation during heavy cutting. The slant angle allows for easy loading , changing and inspection of tools. All guideways are wide wrap-around rectangular type for un-surpassed long-term rigidity and accuracy. The guideways are widely spaced to ensure stability and fully protected. Each guide-way is induction hardened and precision ground. A

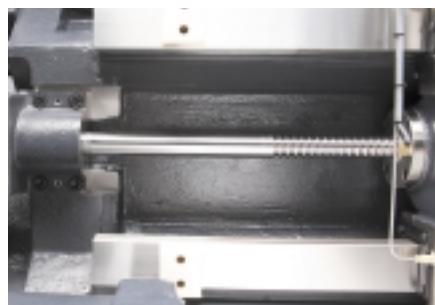
fluoroplastic resin, Rulon 142, is bonded to the mating way surfaces, for its wear and friction characteristics and then hand scraped for a perfect fit and center height. Optional long bed enables extra-long shaft machining.

Rapid Traverse

X-axis **Z-axis**
16 m/min **20 (18) m/min**



• Scraping of surface



• Outstanding rigidity for high feedrates



Eco-Friendly Design

Collection of Waste Lubrication Oil

Less waste lubrication oil extends the life time of the coolant water and cut down the grime and offensive smell of the machine inside.

No Coolant Leakage

Rigorously designed, manufactured and tested machine covers do not permit coolant leakage in any condition. The factory always keeps our environment clean.

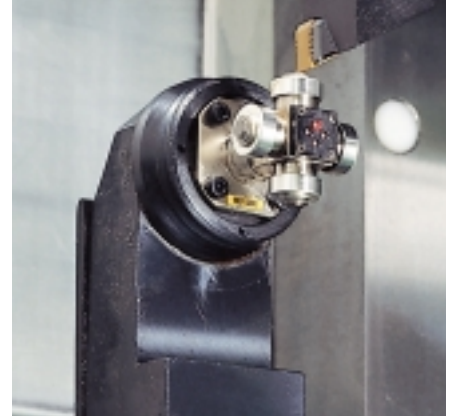
Metered Way Lubrication

Automatic lubrication is provided to all guideways, ball screws and the tailstock quill. A maintenance free piston distributor delivers a precise quantity of oil to each lubrication point. The 1.8 reservoir lasts up to 80 hours. A low level alarm prevents the machine from restarting without lubricant.



Tool Pre-Setter(Opt.)

The automatic tool setter reduces set-up time by minimizing the need for skim cuts, measurements and entering tool offsets. The tool setting arm manually or can be controlled through the program.



Option

Hydraulic Power Unit



The temperature of the hydraulic oil is regulated by a cooling system.

Oil Skimmer(Opt.)



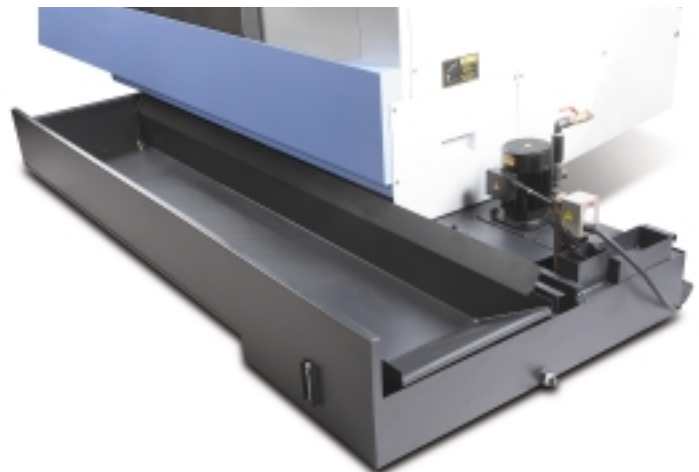
The coolant is kept clean and its life is extended with bed casting channels from the Z axis to a separate reservoir. A belt oil skimmer picks up and removes waste oil from the coolant tank that is easily drained.

Electric Torque Limiters

Each axis ball screw is protected by electric torque limiters to minimize damage in the event of a crash. Upon impact, the limiter immediately stops the machine.

Coolant System

The high pressure flushes chips out of drilled holes, reduces the need for peck drill cycles, meets the requirements of most insert drill manufactures and significantly increases tool life.



The separate, large 280[370] capacity coolant tank and chip pan are separate from the machine bed to prevent heat trans-fer and easy cleaning.

[] : Long bed

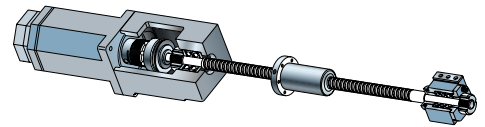
Axis Drive Construction and Tail Stock

Programmable Tailstock(Opt.)



The programmable tailstock body is mounted on the same guideway surface as the headstock. The heavy casting, large 120mm diameter quill, and precision Morse Taper #6 live center provide outstanding rigidity. The 120mm quill stroke is activated by either the program or foot switch. Auto lubrication is provided to the quill and guideways.

Double Pretensioned Ball Screw



Both the X and Z axes features a double pretensioned ball screw, supported on each end by precision class P4 angular contact thrust bearings. Both axes are driven by large diameter, high precision ball screws. Each ball screw has been carefully selected to achieve a combination of high accuracy, high rapid traverse rates and high feed thrust. All ball screws are fully supported on both ends.

Axis Drives



Each axis is powered by a maintenance free digital AC servo motor. These high torque drive motors are connected to the ball screws without intermediate gears for quiet and responsive slide movement with virtually no backlash.

Wide Work Space!

Isolated Gear Box (DI Gear Box)*

Power is delivered to the spindle through a two speed gearbox allowing high spindle speeds as well as powerful low end torque. The gearbox and spindle motor are isolated from the spindle, eliminating transfer of heat and vibration.



* is standard on PUMA480[L]

PUMA 480[LM] BF Gear Box(Std)

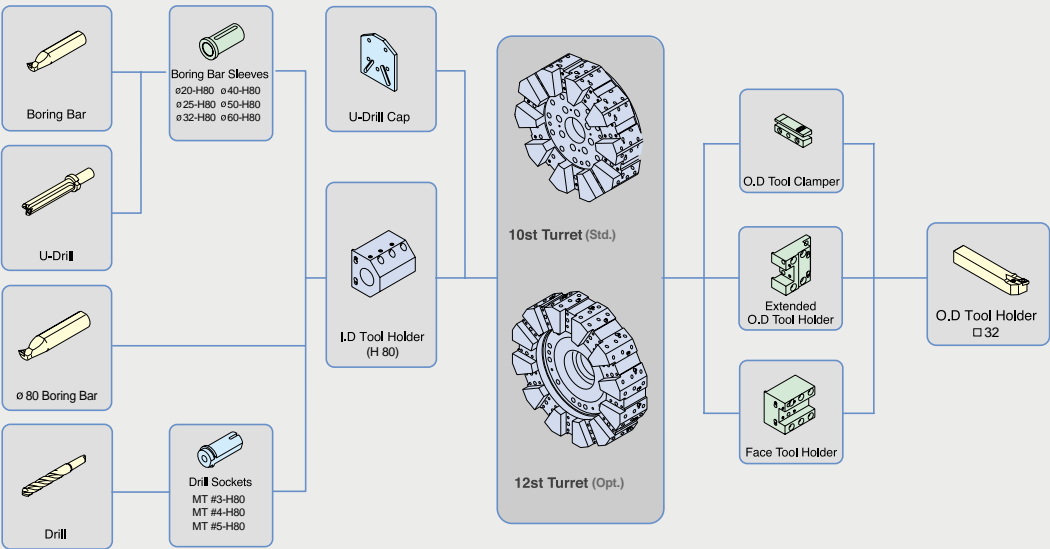


The 37kW spindle motor is directly coupled to Baruffaldi 2-speed electronic transmission, which provides maximum torque. The 2 speed gear box with its precision ground gears provide quiet operation at high speed then transfers its power to the main spindle for vibration free operation resulting in excellent surface finishes.

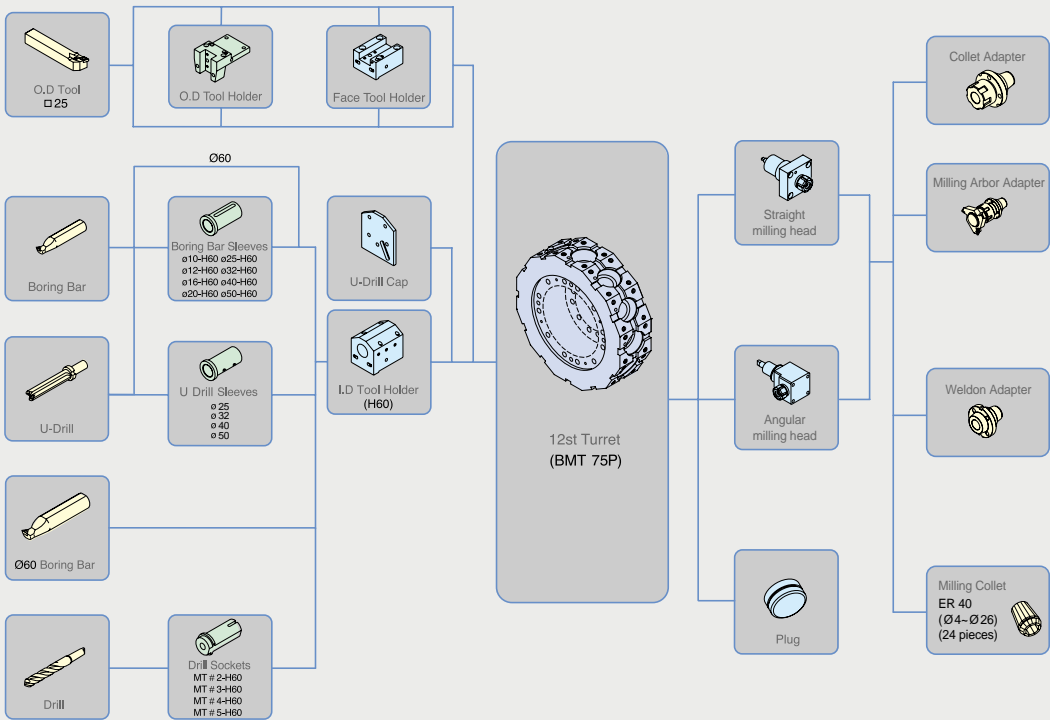
Tooling System

unit : mm

PUMA 480[L]



PUMA 400M[LM]

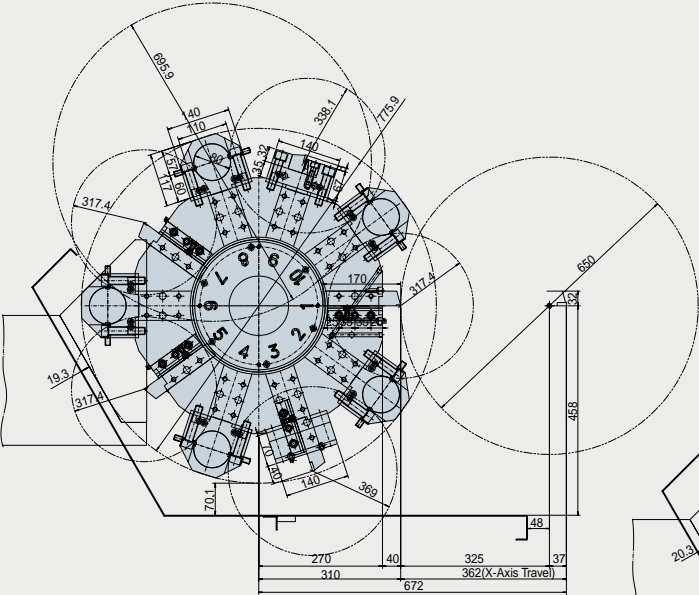


Tool Interference Diagram

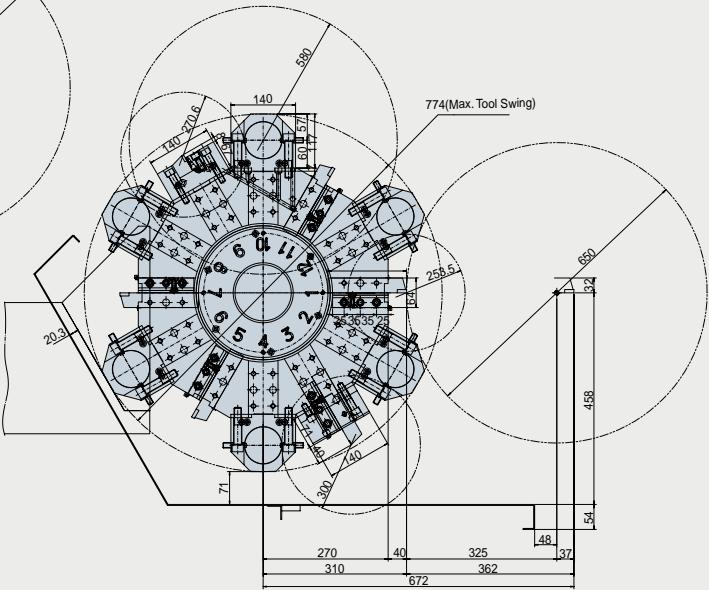
unit : mm

PUMA 480[L]

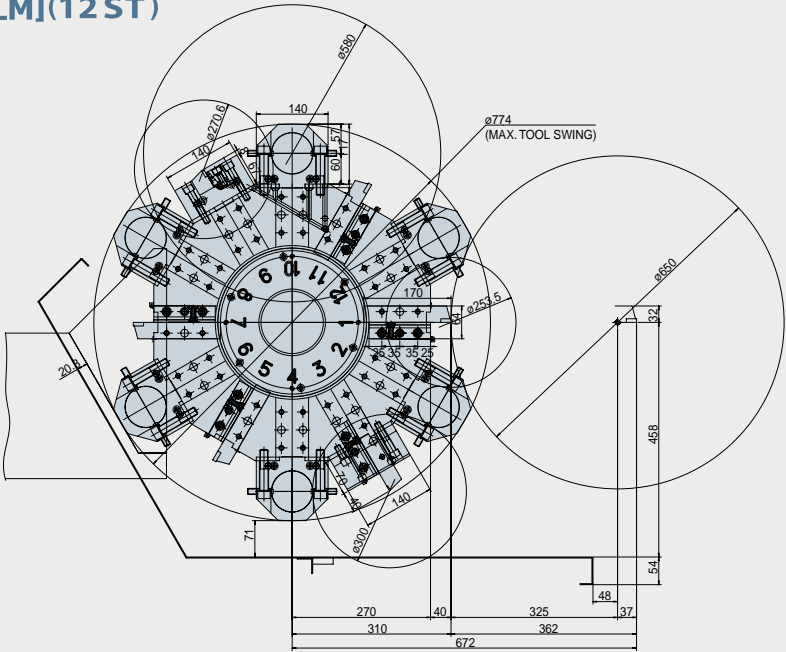
10ST (Std.)



12ST (Opt.)



PUMA 480M[LM](12 ST)

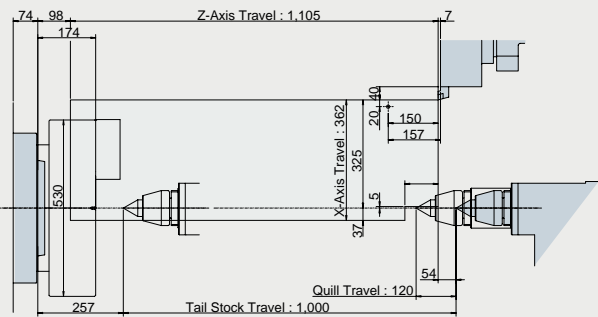


Working Ranges

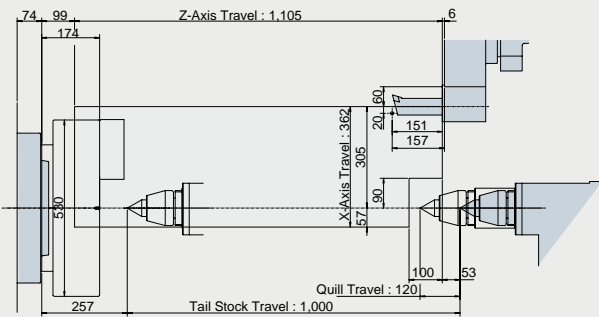
unit : mm

PUMA 480

OD Tool Holder

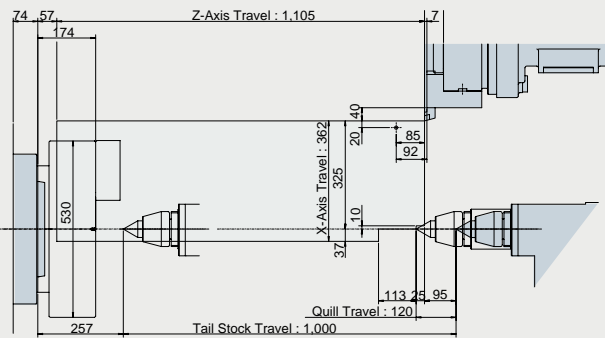


ID Tool holder

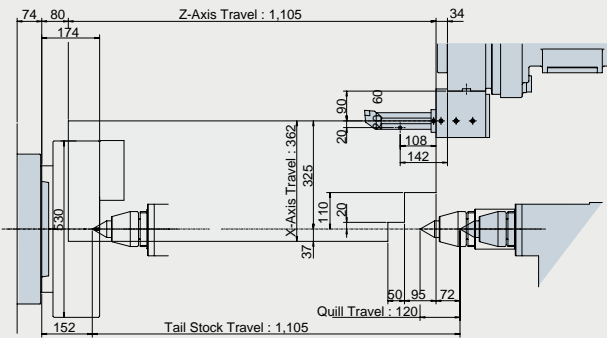


PUMA 480M

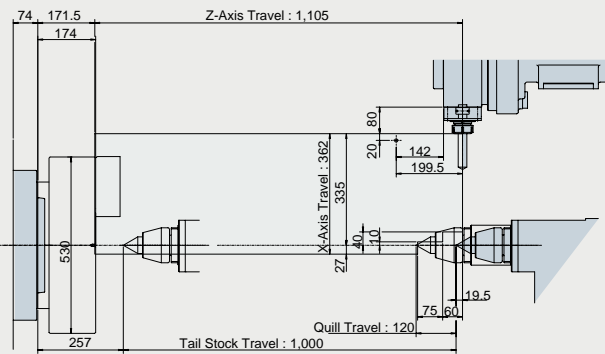
OD Tool Holder



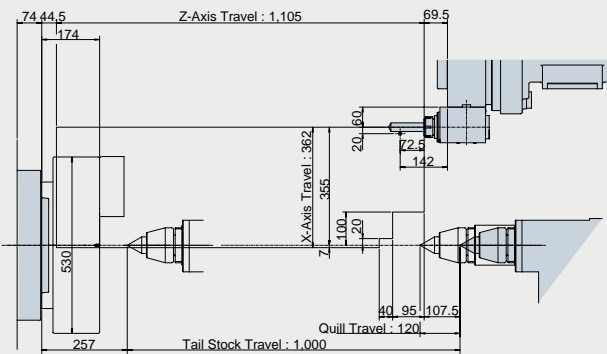
ID Tool holder



Straight milling unit



Angular milling unit

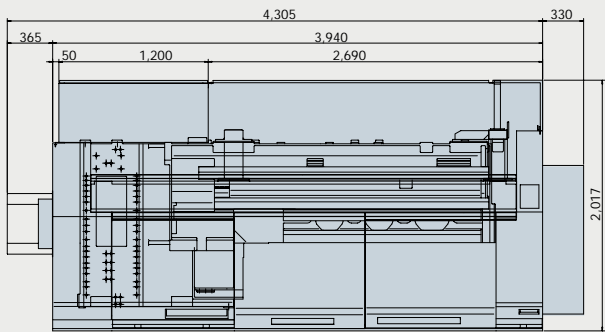


External Dimension

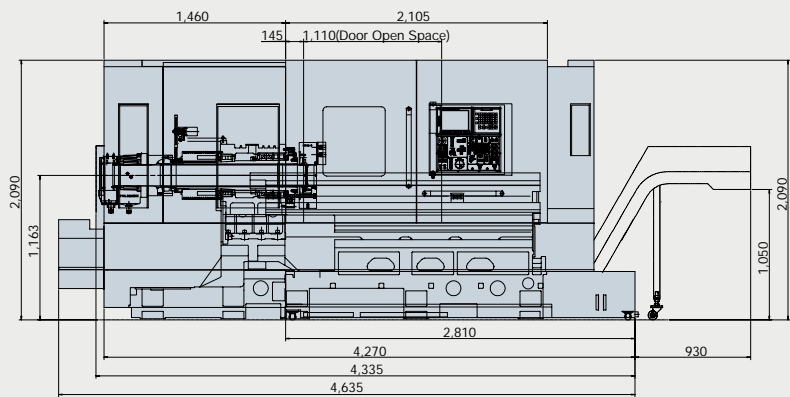
unit : mm

PUMA 480[M]

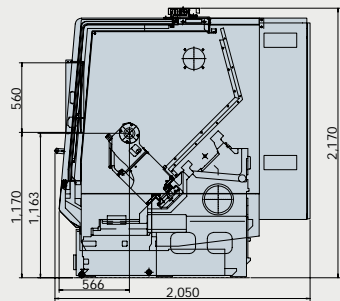
Top View



Front View



Side View

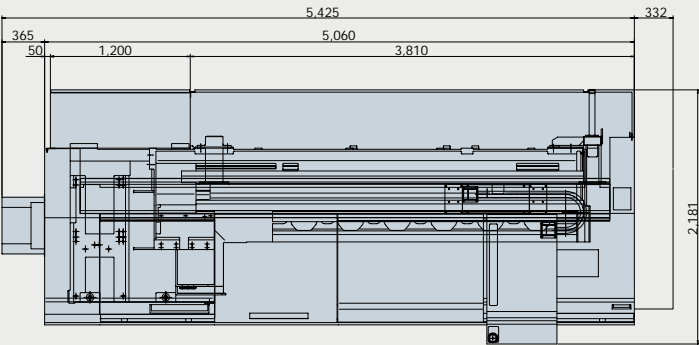


External Dimension

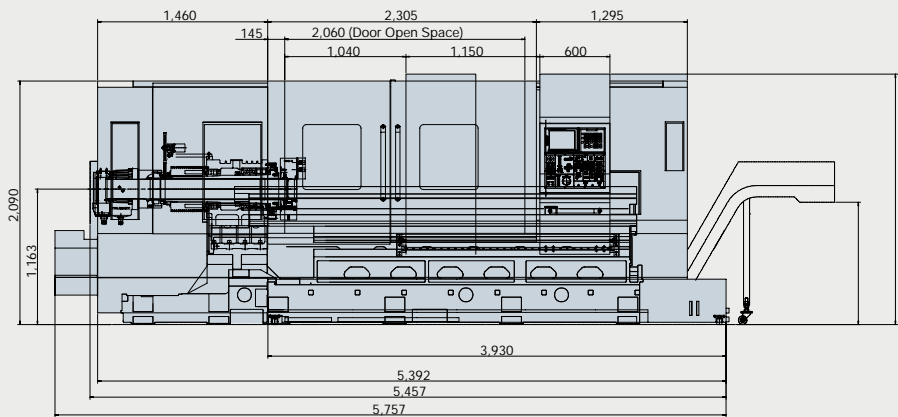
unit : mm

PUMA 480 L[LM]

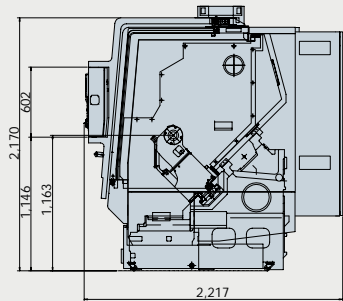
Top View



Front View



Side View



Machine Specifications

	Description	Unit	PUMA 480[L]	PUMA 480M[LM]
Capacity	Swing over bed	mm	900	
	Swing over saddle	mm	720	
	Recom. turning diameter	mm	380	
	Max. turning diameter	mm	650	
	Max. turning length	mm	992[2,042]	951[2,001]
	Bar working diameter	mm	165.5	
Carriage	Travel distance	X-axis	362(57+305)	362(37+325)
		Z-axis	1,105[2,155]	
Main Spindle	Spindle speed	rpm	1,500	
	Spindle nose	ASA	A1 #15	
	Spindle bearing diameter (Front)	mm	240	
	Spindle through hole	mm	181	
	Cs spindle index angle	deg	-	360(in 0.001)
Tool Post	No. of tool station		10st	12st
	OD tool height	mm	32 × 32	25 × 25
	Boring bar diameter	mm	Ø80	Ø60
	Indexing time (1st swivel)	sec	0.25	
	Rotary tool spindle speed	rpm	-	3,000
Feedrate	Rapid traverse	X-axis	m/min	16
		Z-axis	m/min	20[18]
	Max. cutting feedrate	X-axis	mm/rev	500
		Z-axis	mm/rev	500
Tail Stock	Quill diameter	mm	120	
	Quill bore taper	MT#	MT#6	
	Quill travel	mm	120	
Motors	Main spindle motor(30min)	kw	45	
	Servo motor	X-axis	kw	4.0
		Z-axis	kw	7.0[6.0]
	Rotary tool spindle motor	kw	-	11
	Coolant pump	kw	0.4	
Power Source	Electric power supply(Rated capacity)	kVA	53.1	59.1
	Machine height	mm	2,170[2,270]	
Machine Dimensions	Machine size	length	4,335[5,452]	
		width	2,050[2,217]	
	Machine weight	kg	8,450[10,050]	

Standard Feature

Coolant supply equipment	Hydraulic chuck & actuating cylinder	Lubrication equipment
Foot switch	Hydraulic power unit	Soft jaws (total 5sets)
Full enclosure chip and coolant shield	Levelling bolts & plates	Standard tooling kit (tool holders & boring sleeves)
Hand tool kit, including small hand tool for operations	Live center	Work light

Optional Feature

Additional tool holders & sleeves	Chip conveyor	Proximity switches for chuck clamp detection
Air blast for chuck jaw cleaning	Controller : Fanuc 18i-TB	Proximity switches for quill position detection
Air gun	Dual chucking pressure	Signal tower (yellow, red, blue)
Automatic door with safety device	Hardened & ground jaws	Special chucks
Automatic measuring system (in process touch probe)	Hydraulic steady rest	Tailstock quill for dead center (MT #5)
Automatic power off	Manual steady rest	Tool monitoring system
Automatic work loading & unloading equipment	Oil skimmer	Tool pre-setter (hydraulic type)
Bar feeder interface	Pressure switch for chucking pressure check	
Chip bucket	Programmable tail stock	

- Design and specifications are subject to change without prior notice.
- We do not responsible for difference between the information in the catalog and the actual machine.

NC Unit Specifications

	Item	Spec.	Fanuc 21i-TB	Fanuc 18i-TB
Controls	Controlled axes		X,Z,C(!)	X,Z,C(!)
	Simultaneously controlled axes	Std. 2 axes	3 axes(!)	3 axes(!)
Axis Functions	Backlash compensation	0~ ± 9999 pulses		
	Cs contouring control		(!)	(!)
	Follow-up / Chamfering on/off			
	HRV control			
	Increment system 1/10	0.0001mm / 0.00001		Opt.
	Least input increment	0.001mm / 0.0001		
Operation	Stored stroke check1	Overtravel control		
	Automatic operation(memory) / Buffer register			
	Manual handle feed rate	X1, X10, X100		
Interpolation	Search function	Sequence NO. / Program NO.		
	1st, 2nd reference position check / return	G27/G28, -/ G30		
	Circular interpolation	G02, G03		
	Continuous thread cutting			
	Dwell	G04		
	Linear interpolation	G01		
	Multiple threading / Thread cutting retract			
	Polar coordinate interpolation	G12.1, G13.1	(!)	(!)
Feed Functions	Thread cutting / Synchronous cutting			
	Feed per minute / Feed per revolution	G98 / G99		
	Feedrate override	0 - 200 % (10% unit)		
	Jog feed override	0 - 2000 mm/min		
	Rapid traverse override	F0/ 25 / 100 %		
Auxiliary & Spindle Functions	Tangential speed constant control			
	1st Spindle orientation			
	Constant surface speed control	G96, G97		
	M-function	M3 digit		
	Multi-spindle control		(!)	(!)
	Rigid tapping			
Programming Functions	Spindle speed override	0~150%		
	Absolute / Incremental programming			
	Canned cycle for drilling	G80 series		
	Custom macro B			
	Decimal point programming/pocket calculator type decimal point programming			
	Direct drawing dimension programming			
	eZ Guide i	Conversational programming		
	Maximum program dimension	± 99999.999mm/(± 9999.9999 inch)		
	Multi repetitive canned cycle	G70~G76		
	Multi repetitive canned cycle 2			
	Optional block skip(without hardware)	Total 9(Only NC function)		
	Program number / Sequence number	O4 digits / N5 digits		
	Programmable data input	G10		Opt.
	Sub program call	Nested holds4	4	4
Tool Functions	Tape format for FANUC series 10/11			-
	Tape format for FANUC series 15		-	
	Work coordinate system selection	G52, G53, G54~G59		
	Auto tool offset			
	Tool monitoring system		Opt.	Opt.
	Direct input of tool offset value measured B			
	Tool geometry / wear compensation	Geometry & wear data		
	Tool life management		Opt.	
	Tool nose radius compensation	G40~G42		
	Tool number command(T-code function)	T2+2 digits		
Editing Op. Functions	Tool offset	G43, G44, G49		
	Tool offset pairs		64	32
	Tool offset value counter input			
	Background editing			
	Expanded part program editing	Copy, Move, Change of NC program		
	No. of Registered programs		200EA	125EA
	Part program editing / Program protect			
Setting & Display	Part program storage length*1		640m	640m
	Display of spindle speed and T-code at all screen			
	Help function	Alarm&Operation display		
	Self diagnostic function			
	Servo setting screen / Spindle setting screen			
	Status display / Lock function			
Data Input & Output	Tool path graphic display		Opt.(!)	
	External key input / External data input			
	External work number search			
	I/O interface	RS-232C		
	Memory card input and output			
Other Functions	Reader puncher control	CH1 interface		
	Ethernet function	Embedded ethernet function	Opt.	
	MDI / DISPLAY unit		10.4 color LCD	10.4 color LCD
	PMC system			

*1 : Standard Part program length is different on export condition. On the addition of optional functions, its length can be reduced. : Standard OPT : Option (!) : only M type

PUMA 480

<http://domss.doosaninfracore.com>

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Machine Tools

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